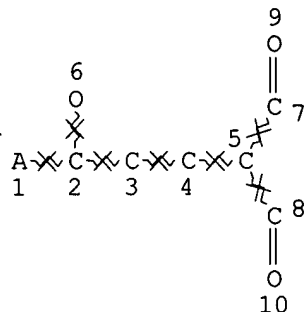```
=> => d que stat 158
L1   1 SEA FILE=REGISTRY ABB=ON   PLU=ON   151600-50-9/RN
L2   9 SEA FILE=HCAPLUS ABB=ON   PLU=ON   L1
L3   SCR 1918 OR 2043 OR 1840 OR 1949 OR 2010
L4   STR
```

```
                        9
                        O
          6   ‖
          O   C 7
          ╳   5 ⫣
   A╳C╳C╳C╳C
   1   2   3   4   ⫣
                        C 8
                        ‖
                        O
                        10
```
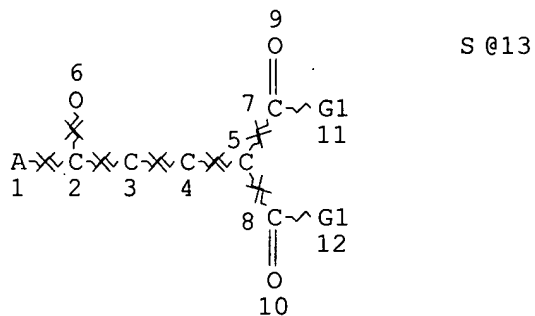
NODE ATTRIBUTES:
CONNECT IS X2  RC AT    6
CONNECT IS E1  RC AT    9
CONNECT IS E1  RC AT   10
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS  10

STEREO ATTRIBUTES: NONE

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L5  (      12118)SEA FILE=REGISTRY SSS FUL L4 NOT L3
L6              STR
```

```
                        9
                        O              S @13
          6             ‖
          O           7 C ⤳ G1
          ╳          5 ⫣    11
   A╳C╳C╳C╳C
   1   2   3   4     ⫣
                     8 C ⤳ G1
                        ‖    12
                        O
                        10
```

VAR G1=O/N/P/13
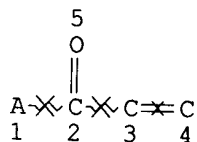NODE ATTRIBUTES:
CONNECT IS X2 RC AT   6
CONNECT IS E1 RC AT   9
CONNECT IS E1 RC AT   10
CONNECT IS X2 RC AT   13
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 13

STEREO ATTRIBUTES: NONE

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L7  (       2503)SEA FILE=REGISTRY SUB=L5 SSS FUL L6
L8              STR
```

```
       5
       O
       ‖
A—×—C—×—C—×—C
1     2     3     4
```

NODE ATTRIBUTES:
CONNECT IS E1 RC AT   5
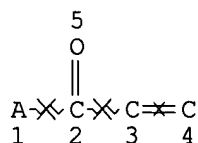DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS   5

STEREO ATTRIBUTES: NONE

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L9              SCR 1918 OR 2043 OR 1839 OR 1944 OR 2005
L10 (      6815)SEA FILE=REGISTRY SSS FUL L8 NOT L9
L11 (      1507)SEA FILE=HCAPLUS ABB=ON  PLU=ON  L7/P
L12 (     31232)SEA FILE=HCAPLUS ABB=ON  PLU=ON  L10/RACT
L13 (       266)SEA FILE=HCAPLUS ABB=ON  PLU=ON  L11 AND L12
L14             QUE ABB=ON  PLU=ON  "ASYMMETRIC SYNTHESIS AND INDUCTIO
                N"+PFT,OLD,NT/CT
L15             QUE ABB=ON  PLU=ON  "MICHAEL REACTION"+PFT,OLD,NT/CT
L16             QUE ABB=ON  PLU=ON  "MICHAEL REACTION CATALYSTS"+PFT,O
                LD,NT/CT
L17 (        30)SEA FILE=HCAPLUS ABB=ON  PLU=ON  L14 AND L13
L18 (        21)SEA FILE=HCAPLUS ABB=ON  PLU=ON  L17 AND (L15 OR L16)
L19 (     31232)SEA FILE=HCAPLUS ABB=ON  PLU=ON  L10/RACT
L20 (      1337)SEA FILE=HCAPLUS ABB=ON  PLU=ON  L19 AND L14
L21 (       176)SEA FILE=HCAPLUS ABB=ON  PLU=ON  L20 AND (L15 OR L16)
L22 (        92)SEA FILE=HCAPLUS ABB=ON  PLU=ON  L21 AND L16
L23 (    744935)SEA FILE=REGISTRY ABB=ON  PLU=ON  ((FE OR CO OR NI OR
                RU OR RH OR PD OR OS OR IR OR PT)(L)N)/ELS
L24 (    316118)SEA FILE=REGISTRY ABB=ON  PLU=ON  L23 AND 1-2/N
L25 (    262888)SEA FILE=REGISTRY ABB=ON  PLU=ON  L24 AND 1/M
L26 (     22790)SEA FILE=REGISTRY ABB=ON  PLU=ON  L25 AND 1/RU
L27 (     80253)SEA FILE=REGISTRY ABB=ON  PLU=ON  L25 AND (1/OS OR
                1/IR OR 1/PT OR 1/PD)
L28 (    159878)SEA FILE=REGISTRY ABB=ON  PLU=ON  L25 NOT (L26 OR L27)

L29 (     76518)SEA FILE=REGISTRY ABB=ON  PLU=ON  L28 AND 1/FE
L30 (     83360)SEA FILE=REGISTRY ABB=ON  PLU=ON  L25 NOT (L26 OR L27
                OR L29)
L31             QUE ABB=ON  PLU=ON  L26
L32             QUE ABB=ON  PLU=ON  L27
L33             QUE ABB=ON  PLU=ON  L29
L34             QUE ABB=ON  PLU=ON  L30
L35             QUE ABB=ON  PLU=ON  L31 OR L32 OR L33 OR L34
L36 (        10)SEA FILE=HCAPLUS ABB=ON  PLU=ON  L22 AND L35
L37 (      9613)SEA FILE=HCAPLUS ABB=ON  PLU=ON  L5
L38 (     50879)SEA FILE=HCAPLUS ABB=ON  PLU=ON  L10
L39 (        31)SEA FILE=HCAPLUS ABB=ON  PLU=ON  L37 AND L38 AND L35
L40 (         7)SEA FILE=HCAPLUS ABB=ON  PLU=ON  L39 AND L14
L41 (      1971)SEA FILE=HCAPLUS ABB=ON  PLU=ON  L7
L42 (       315)SEA FILE=HCAPLUS ABB=ON  PLU=ON  L41 AND L10
L43 (        14)SEA FILE=HCAPLUS ABB=ON  PLU=ON  L42 AND L35
```

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L44 (      39)SEA FILE=HCAPLUS ABB=ON  PLU=ON  L18 OR L36 OR L40 OR
              L43
L45 (      62)SEA FILE=HCAPLUS ABB=ON  PLU=ON  L44 OR L17 OR L39
L46 (      48)SEA FILE=HCAPLUS ABB=ON  PLU=ON  L45 AND (L14 OR L15
              OR L16)
L47           QUE ABB=ON  PLU=ON  PY<2005 OR PRY<2005 OR AY<2005 OR
              MY<2005 OR REVIEW/DT
L48 (      34)SEA FILE=HCAPLUS ABB=ON  PLU=ON  L46 AND L47
L49 (      15)SEA FILE=HCAPLUS ABB=ON  PLU=ON  L48 AND L14 AND L15
              AND L16
L50        34 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L48 OR L49
L51         3 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L2 AND L50
L52         6 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L2 NOT L51
L53           STR
```

```
      5
      O
      ‖
A-XX-C-XX-C-XX-C
1    2    3    4
```

```
NODE ATTRIBUTES:
CONNECT IS E1  RC AT    5
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS    5

STEREO ATTRIBUTES: NONE
L54               SCR 1918 OR 2043 OR 1839 OR 1944 OR 2005
L55        6815 SEA FILE=REGISTRY SSS FUL L53 NOT L54
L56       50897 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L55
L57           6 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L52 AND L56
L58           6 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L57 AND L47
```

```
=> d 158 1-6 ibib abs hitstr hitind
```

```
L58  ANSWER 1 OF 6  HCAPLUS  COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER:        2003:4470  HCAPLUS
DOCUMENT NUMBER:         138:337475
TITLE:                   Microwave assisted enantioselective Michael
                         addition reaction using BINOL-Al-Li catalyst
AUTHOR(S):               Narasimhan, S.; Velmathi, S.
CORPORATE SOURCE:        Centre for Natural Products, SPIC Science
                         Foundation, Chennai, 600 032, India
SOURCE:                  Synthetic Communications (2002),
                         32(24), 3791-3795
                         CODEN: SYNCAV; ISSN: 0039-7911
PUBLISHER:               Marcel Dekker, Inc.
DOCUMENT TYPE:           Journal
LANGUAGE:                English
OTHER SOURCE(S):         CASREACT 138:337475
AB   Enantioselective (S)-BINOL-Al-Li catalyzed Michael reaction of
     malonates and thiols with cyclic enones are achieved with high
     enantioselectivity in a remarkably lesser reaction time using
     microwaves.
IT   930-30-3, 2-Cyclopentenone 930-68-7,
```
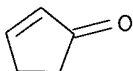
2-Cyclohexenone
RL: RCT (Reactant); RACT (Reactant or reagent)
    (preparation of saturated cycloketones by microwave assisted
    enantioselective Michael addition reaction of malonates and thiols
    with cyclic enones using BINOL-Al-Li catalyst)
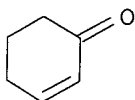RN   930-30-3 HCAPLUS
CN   2-Cyclopenten-1-one (6CI, 7CI, 8CI, 9CI)   (CA INDEX NAME)

RN   930-68-7 HCAPLUS
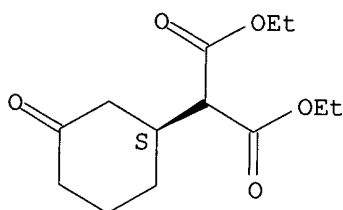CN   2-Cyclohexen-1-one (6CI, 8CI, 9CI)   (CA INDEX NAME)

IT   **151600-50-9P**
      RL: SPN (Synthetic preparation); PREP (Preparation)
          (preparation of saturated cycloketones by microwave assisted
          enantioselective Michael addition reaction of malonates and thiols
          with cyclic enones using BINOL-Al-Li catalyst)
RN   151600-50-9 HCAPLUS
CN   Propanedioic acid, [(1S)-3-oxocyclohexyl]-, diethyl ester (9CI)
      (CA INDEX NAME)

Absolute stereochemistry. Rotation (-).

CC   21-2 (General Organic Chemistry)
IT   105-53-3, Diethyl malonate   106-45-6, 4-Methylthiophenol
      108-98-5, Thiophenol, reactions **930-30-3**,
      2-Cyclopentenone **930-68-7**, 2-Cyclohexenone   13195-64-7,
      Diisopropyl malonate   15014-25-2, Dibenzyl malonate
      RL: RCT (Reactant); RACT (Reactant or reagent)
          (preparation of saturated cycloketones by microwave assisted
          enantioselective Michael addition reaction of malonates and thiols
          with cyclic enones using BINOL-Al-Li catalyst)
IT   **151600-50-9P**   154194-47-5P   154194-49-7P   193530-87-9P
      334699-04-6P   334699-05-7P   518028-03-0P   518028-04-1P
      RL: SPN (Synthetic preparation); PREP (Preparation)
          (preparation of saturated cycloketones by microwave assisted
          enantioselective Michael addition reaction of malonates and thiols
          with cyclic enones using BINOL-Al-Li catalyst)

REFERENCE COUNT: 6   THERE ARE 6 CITED REFERENCES AVAILABLE
                                FOR THIS RECORD. ALL CITATIONS AVAILABLE
                         .   IN THE RE FORMAT

L58 ANSWER 2 OF 6 HCAPLUS   COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2001:872181 HCAPLUS
DOCUMENT NUMBER: 136:262933
TITLE: Aluminium-SALEN complex: a new catalyst for
                            the enantioselective Michael reaction
AUTHOR(S):   Jha, S. C.; Joshi, N. N.
CORPORATE SOURCE: Division of Organic Synthesis, National
                            Chemical Laboratory, Pune, 411008, India
SOURCE: Tetrahedron: Asymmetry (2001),
                            12(17), 2463-2466
                            CODEN: TASYE3; ISSN: 0957-4166
PUBLISHER: Elsevier Science Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S):   CASREACT 136:262933
AB   A new heterobimetallic complex prepared from a chiral SALEN ligand
     and Red-Al was found to catalyze the Michael reaction between
     various dialkyl malonates and cycloalkenones to give products in
     high yields with e.e.s of up to 58%.
IT   930-30-3, 2-Cyclopentenone 930-68-7,
     2-Cyclohexenone
     RL: RCT (Reactant); RACT (Reactant or reagent)
         (enantioselective Michael addition of malonates to cycloalkenones
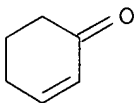   using sodium-aluminum-SALEN complex catalyst)
RN   930-30-3 HCAPLUS
CN   2-Cyclopenten-1-one (6CI, 7CI, 8CI, 9CI)   (CA INDEX NAME)
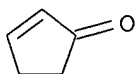
RN   930-68-7 HCAPLUS
CN   2-Cyclohexen-1-one (6CI, 8CI, 9CI)   (CA INDEX NAME)
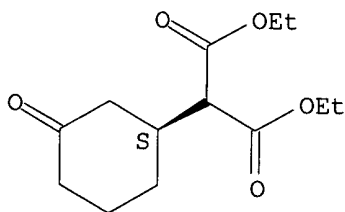

IT   151600-50-9P
     RL: SPN (Synthetic preparation); PREP (Preparation)
         (preparation by enantioselective Michael addition of malonates to
         cycloalkenones using sodium-aluminum-SALEN complex catalyst)
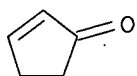RN   151600-50-9 HCAPLUS
CN   Propanedioic acid, [(1S)-3-oxocyclohexyl]-, diethyl ester (9CI)
     (CA INDEX NAME)

Absolute stereochemistry. Rotation (-).

CC   24-5 (Alicyclic Compounds)
      Section cross-reference(s): 67
IT   105-53-3, Diethyl malonate   108-59-8, Dimethyl malonate
      541-16-2, Di(tert-butyl) malonate   609-08-5, Diethyl
      methylmalonate **930-30-3**, 2-Cyclopentenone
      930-68-7, 2-Cyclohexenone   13195-64-7, Di(isopropyl)
      malonate   15014-25-2, Dibenzyl malonate
      RL: RCT (Reactant); RACT (Reactant or reagent)
         (enantioselective Michael addition of malonates to cycloalkenones
          using sodium-aluminum-SALEN complex catalyst)
IT   **151600-50-9P**   154194-47-5P   154194-50-0P   160115-23-1P
      193530-87-9P   334699-04-6P   405219-89-8P   405219-90-1P
      RL: SPN (Synthetic preparation); PREP (Preparation)
         (preparation by enantioselective Michael addition of malonates to
          cycloalkenones using sodium-aluminum-SALEN complex catalyst)
REFERENCE COUNT: 18   THERE ARE 18 CITED REFERENCES AVAILABLE
                              FOR THIS RECORD. ALL CITATIONS AVAILABLE
                              IN THE RE FORMAT

L58 ANSWER 3 OF 6   HCAPLUS   COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2001:85161   HCAPLUS
DOCUMENT NUMBER: 134:295404
TITLE: Novel enantiomer-switching catalysts for
                          asymmetric reductions and Michael reactions
AUTHOR(S):   Narasimhan, S.; Velmathi, S.; Balakumar, R.;
                          Radhakrishnan, V.
CORPORATE SOURCE: Centre for Natural Products, SPIC Science
                          Foundation, Guindy, Chennai, 600 032, India
SOURCE: Tetrahedron Letters (2001), 42(4),
                          719-721
                          CODEN: TELEAY; ISSN: 0040-4039
PUBLISHER: Elsevier Science Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S):   CASREACT 134:295404
AB   The newly developed chiral ligands (S)-2-HOC6H4CH2NHCH(CHMe2)R (R
      = CO2Me, CH2OH) show opposite enantioselectivity in prochiral
      ketone reduction and Michael addition reactions resulting in the production
      of both enantiomers of the products in good chemical and enantiomeric
      yield.
IT   **930-30-3**, 2-Cyclopentenone **930-68-7**,
      2-Cyclohexenone
      RL: RCT (Reactant); RACT (Reactant or reagent)
         (enantiomer-switching catalysts for asym. redns. and Michael
          reactions)
RN   930-30-3 HCAPLUS
CN   2-Cyclopenten-1-one (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

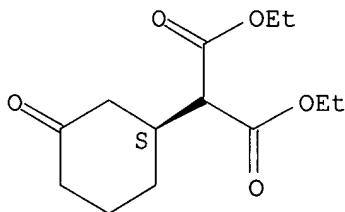RN   930-68-7   HCAPLUS
CN   2-Cyclohexen-1-one (6CI, 8CI, 9CI)   (CA INDEX NAME)
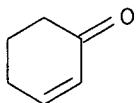
IT   **151600-50-9P**
      RL: SPN (Synthetic preparation); PREP (Preparation)
         (enantiomer-switching catalysts for asym. redns. and Michael
         reactions)
RN   151600-50-9   HCAPLUS
CN   Propanedioic acid, [(1S)-3-oxocyclohexyl]-, diethyl ester (9CI)
      (CA INDEX NAME)

Absolute stereochemistry.   Rotation (-).

CC   21-2 (General Organic Chemistry)
IT   90-02-8, reactions   98-86-2, Acetophenone, reactions   105-53-3,
      Diethyl malonate   532-27-4, α-Chloroacetophenone
      614-47-1, (E)-1,3-Diphenylpropenone **930-30-3**,
      2-Cyclopentenone **930-68-7**, 2-Cyclohexenone   5619-05-6
      13195-64-7, Diisopropyl malonate   15014-25-2, Dibenzyl malonate
      35006-49-6
      RL: RCT (Reactant); RACT (Reactant or reagent)
         (enantiomer-switching catalysts for asym. redns. and Michael
         reactions)
IT   1445-91-6P   1517-69-7P   7472-83-5P   56751-12-3P   70111-05-6P
      151600-50-9P   154194-47-5P   154194-49-7P   164931-75-3P
      164931-78-6P   177722-18-8P   193530-87-9P   209850-79-3P
      334699-04-6P   334699-05-7P   334699-06-8P
      RL: SPN (Synthetic preparation); PREP (Preparation)
         (enantiomer-switching catalysts for asym. redns. and Michael
         reactions)
REFERENCE COUNT: 10   THERE ARE 10 CITED REFERENCES AVAILABLE
                                    FOR THIS RECORD. ALL CITATIONS AVAILABLE
                                    IN THE RE FORMAT

L58 ANSWER 4 OF 6 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1996:127979 HCAPLUS
DOCUMENT NUMBER: 124:175462
TITLE: Preparation of optically active

binaphthol-metal complex for catalyzing
asymmetric Michael addition

INVENTOR(S):   Shibazaki, Masakatsu; Sasai, Hiroaki
PATENT ASSIGNEE(S):   Nagase & Co Ltd, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.
                                CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 07265709	A2	19951017	JP 1994-62727	
				1994 0331
			<--	
JP 3439255	B2	20030825		
PRIORITY APPLN. INFO.:			JP 1994-62727	
				1994 0331
			<--	

OTHER SOURCE(S):   CASREACT 124:175462; MARPAT 124:175462
GI
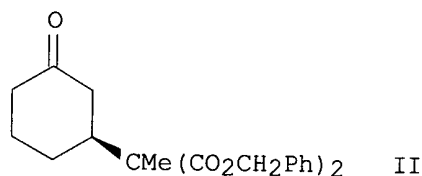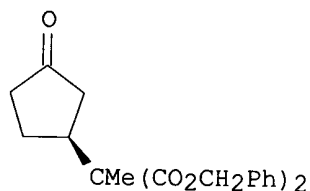
AB   A metal complex promoting asym. Michael addition is prepared by mixing
      a donor compound of asym. Michael reaction with a rare earth metal
      alkoxide in solvent to prepare a reaction mixture containing the enolate
      of the Michael reaction donor and then adding an optically active
      binaphthol, preferably 1,1'-bi-2-naphthol. The Michael reaction
      donor compound is represented by formula R1COCHR3COR2 (R1 = aryloxy,
      MeO, EtO, Me; R2 = aryloxy, MeO, EtO; R3 = H, Me, Et). The
      preferred rare earth metal alkoxide is an alkoxide of lanthanum.
      Thus, a THF solution of 0.1 mmol dibenzyl methylmalonate was slowly
      added to a THF solution of 0.1 mmol La(OCHMe2)3 at 0° and
      stirred at 0° for 30 min to give the enolate solution, to
      which was slowly added a THF solution of 0.1 mmol
      (S)-1,1'-bi-2-naphthol at 0°, stirred at 0° for 30
      min, and evaporated under reduced pressure to give the
      lanthanum-binaphthol complex. The evaporation of the solvent markedly
      improved the purity and yield of the desired product. The latter
      complex was redissolved in 1.0 mL THF, followed by adding 0.9 mmol
      dibenzyl methylmalonate and 1.0 mmol 2-cyclopenten-1-one at
      -20°, and the resulting mixture was stirred at -20°
      for 60 h to give after workup and silica gel chromatog., the
      Michael reaction adduct [(-)-I] of 95% optical purity in 97%
      yield. Similar reaction of 2-cyclohexen-1-one with dibenzyl
      methylmalonate gave the Michael reaction adduct (II) of 87%

optical purity in 83% yield.
IT   **151600-50-9P**
     RL: SPN (Synthetic preparation); PREP (Preparation)
         (Michael reaction adduct; preparation of optically active
         binaphthol-lanthanum complex as catalyst for asym. Michael
         addition)
RN   151600-50-9 HCAPLUS
CN   Propanedioic acid, [(1S)-3-oxocyclohexyl]-, diethyl ester (9CI)
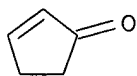   (CA INDEX NAME)

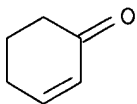Absolute stereochemistry. Rotation (-).
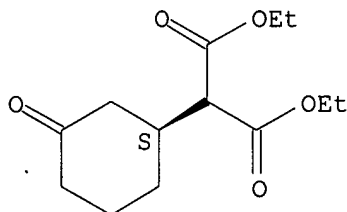
IT   **78-94-4**, Methyl vinyl ketone, reactions **930-30-3**
     , 2-Cyclopenten-1-one **930-68-7**, 2-Cyclohexen-1-one
     RL: RCT (Reactant); RACT (Reactant or reagent)
         (preparation of optically active binaphthol-lanthanum complex as
         catalyst for asym. Michael addition)
RN   78-94-4 HCAPLUS
CN   3-Buten-2-one (8CI, 9CI)   (CA INDEX NAME)
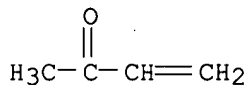
RN   930-30-3 HCAPLUS
CN   2-Cyclopenten-1-one (6CI, 7CI, 8CI, 9CI)   (CA INDEX NAME)

RN   930-68-7 HCAPLUS
CN   2-Cyclohexen-1-one (6CI, 8CI, 9CI)   (CA INDEX NAME)

IC   ICM B01J031-22
     ICS C07C067-347; C07C069-716
ICA C07B053-00; C07B061-00
ICI C07M007-00
CC   24-5 (Alicyclic Compounds)

IT **151600-50-9P**   154194-46-4P   154194-47-5P   154194-48-6P
    154194-49-7P   154194-50-0P   154194-51-1P   160115-23-1P
    173837-40-6P   173837-41-7P   173837-42-8P   173837-43-9P
    173837-44-0P
    RL: SPN (Synthetic preparation); PREP (Preparation)
        (Michael reaction adduct; preparation of optically active
        binaphthol-lanthanum complex as catalyst for asym. Michael
        addition)
IT **78-94-4,** Methyl vinyl ketone, reactions   105-53-3,
    Diethyl malonate   108-59-8, Dimethyl malonate   126-39-6,
    2-Ethyl-2-methyl-1,3-dioxolane **930-30-3,**
    2-Cyclopenten-1-one **930-68-7,** 2-Cyclohexen-1-one
    15014-25-2, Dibenzyl malonate   20194-18-7, Sodium benzyloxide
    37526-93-5, Benzyl 2-methylacetoacetate
    RL: RCT (Reactant); RACT (Reactant or reagent)
        (preparation of optically active binaphthol-lanthanum complex as
        catalyst for asym. Michael addition)

L58 ANSWER 5 OF 6   HCAPLUS   COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1994:244152   HCAPLUS
DOCUMENT NUMBER: 120:244152
TITLE: Catalytic Asymmetric Michael Reactions
                           Promoted by a Lithium-Free Lanthanum-BINOL
                           Complex
AUTHOR(S):   Sasai, Hiroaki; Arai, Takayoshi; Shibasaki,
                           Masakatsu
CORPORATE SOURCE: Faculty of Pharmaceutical Sciences, University
                           of Tokyo, Tokyo, 113, Japan
SOURCE: Journal of the American Chemical Society (
                           1994), 116(4), 1571-2
                           CODEN: JACSAT; ISSN: 0002-7863
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S):   CASREACT 120:244152
AB   Lithium free [1,1'-binaphthalene]-2,2'-diol (BINOL)-lanthanum
     complex prepared from La(OCHMe2)3 and 1 mol equiv of (S)-BINOL is
     effective in catalytic asym Michael reactions. Thus, treatment of
     cyclopentenone with dibenzyl methylmalonate in THF containing ca. 10
     mol % of this catalyst at -20° for 48 h gave the
     corresponding Michael adduct of 74% ee in 86% yield. The asym.
     lanthanum ester enolate prepared from, e.g.., the appropriate
     malonate or keto ester, 1 mol equiv of La(OCHMe2)3, and 1 mol
     equiv of (S)-BINOL is a more effective catalyst in asym. Michael
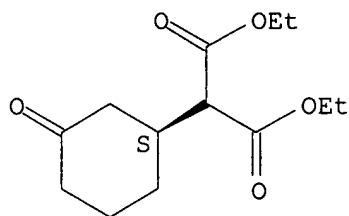   reactions.
IT   **151600-50-9**
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (asym. synthesis by Michael reaction promoted by lithium-free
   lanthanum-BINOL complex)
RN   151600-50-9   HCAPLUS
CN   Propanedioic acid, [(1S)-3-oxocyclohexyl]-, diethyl ester (9CI)
     (CA INDEX NAME)

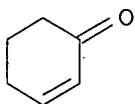Absolute stereochemistry. Rotation (-).

IT   **78-94-4**, 3-Buten-2-one, reactions **930-30-3**,
      2-Cyclopenten-1-one **930-68-7**, 2-Cyclohexen-1-one
      RL: RCT (Reactant); RACT (Reactant or reagent)
          (reactant, in catalytic asym. Michael reaction promoted by
          lithium-free lanthanum-BINOL complex)
RN   78-94-4   HCAPLUS
CN   3-Buten-2-one (8CI, 9CI)   (CA INDEX NAME)
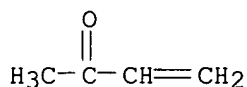
RN   930-30-3   HCAPLUS
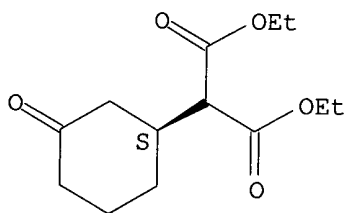CN   2-Cyclopenten-1-one (6CI, 7CI, 8CI, 9CI)   (CA INDEX NAME)
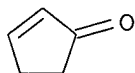
RN   930-68-7   HCAPLUS
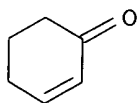CN   2-Cyclohexen-1-one (6CI, 8CI, 9CI)   (CA INDEX NAME)

CC   24-5 (Alicyclic Compounds)
      Section cross-reference(s): 23
IT   **151600-50-9**   154194-46-4   154194-47-5   154194-48-6
      154194-49-7   154194-50-0   154194-51-1
      RL: RCT (Reactant); RACT (Reactant or reagent)
          (asym. synthesis by Michael reaction promoted by lithium-free
          lanthanum-BINOL complex)
IT   **78-94-4**, 3-Buten-2-one, reactions   105-53-3, Diethyl
      malonate   108-59-8, Dimethyl malonate **930-30-3**,
      2-Cyclopenten-1-one **930-68-7**, 2-Cyclohexen-1-one
      15014-25-2, Dibenzyl malonate   37526-93-5, Benzyl
      2-methylacetoacetate   82794-36-3, Dibenzyl methylmalonate
      RL: RCT (Reactant); RACT (Reactant or reagent)
          (reactant, in catalytic asym. Michael reaction promoted by
          lithium-free lanthanum-BINOL complex)

L58 ANSWER 6 OF 6 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1994:8198 HCAPLUS
DOCUMENT NUMBER: 120:8198
TITLE: Catalytic, enantioselective Michael addition
                         of a malonate to prochiral
                         α,β-unsaturated aldehydes and
                         ketones
AUTHOR(S):   Yamaguchi, Masahiko; Shiraishi, Tai; Hirama,
                         Masahiro
CORPORATE SOURCE: Fac. Sci., Tohoku Univ., Sendai, 980, Japan
SOURCE: Angewandte Chemie (1993), 105(8),
                         1243-5 (See also Angew. Chem., Int. Ed. Engl.,
                         1993, 32(8), 1176-8)
                         CODEN: ANCEAD; ISSN: 0044-8249
DOCUMENT TYPE: Journal
LANGUAGE: German
OTHER SOURCE(S):   CASREACT 120:8198
AB   Reaction of RCOCH:CHR1 [R = Me, R1 = Me, pentyl, Ph; R = Pr, R1 =
     Me; RR1 = (CH2)4, (CH2)3; R = H, R1 = Pr, Me] with CH2(CO2CHMe2)2
     in presence of the Rb salt of proline gave RCOCH2CHR1CH(CO2CHMe2)2
     stereoselectively.
IT   **151600-50-9P**
     RL: SPN (Synthetic preparation); PREP (Preparation)
         (preparation by stereoselective Michael reaction)
RN   151600-50-9 HCAPLUS
CN   Propanedioic acid, [(1S)-3-oxocyclohexyl]-, diethyl ester (9CI)
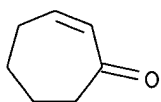   (CA INDEX NAME)

Absolute stereochemistry. Rotation (-).

IT   **930-68-7**, 2-Cyclohexen-1-one **1121-66-0**,
     2-Cyclohepten-1-one **3102-33-8 32397-56-1**
     RL: RCT (Reactant); RACT (Reactant or reagent)
         (stereoselective Michael reaction with malonate)
RN   930-68-7 HCAPLUS
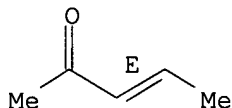CN   2-Cyclohexen-1-one (6CI, 8CI, 9CI) (CA INDEX NAME)

RN   1121-66-0 HCAPLUS
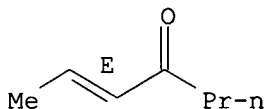CN   2-Cyclohepten-1-one (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

```
RN   3102-33-8   HCAPLUS
CN   3-Penten-2-one, (3E)- (9CI)   (CA INDEX NAME)
```

Double bond geometry as shown.


```
RN   32397-56-1  HCAPLUS
CN   2-Hepten-4-one, (2E)- (9CI)   (CA INDEX NAME)
```

Double bond geometry as shown.


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CC   23-17 (Aliphatic Compounds)
IT   151600-45-2P   151600-46-3P   151600-47-4P   151600-48-5P
     151600-49-6P 151600-50-9P   151600-51-0P   151600-52-1P
     RL: SPN (Synthetic preparation); PREP (Preparation)
         (preparation by stereoselective Michael reaction)
IT   123-73-9 930-68-7, 2-Cyclohexen-1-one 1121-66-0
     , 2-Cyclohepten-1-one   1896-62-4 3102-33-8   6728-26-3
     18402-83-0 32397-56-1
     RL: RCT (Reactant); RACT (Reactant or reagent)
         (stereoselective Michael reaction with malonate)
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    (FILE 'HOME' ENTERED AT 08:48:41 ON 22 NOV 2006)

    FILE 'REGISTRY' ENTERED AT 08:48:50 ON 22 NOV 2006
L1           1 SEA ABB=ON  PLU=ON  151600-50-9/RN

    FILE 'HCAPLUS' ENTERED AT 08:49:00 ON 22 NOV 2006
L2           9 SEA ABB=ON  PLU=ON  L1
             D SCAN
             D SAV
             ACT SHI806HCP/A
             ---------
L3             SCR 1918 OR 2043 OR 1840 OR 1949 OR 2010
L4             STR
L5  (    12118)SEA SSS FUL L4 NOT L3
L6             STR
L7  (     2503)SEA SUB=L5 SSS FUL L6
L8             STR
```

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L9                SCR 1918 OR 2043 OR 1839 OR 1944 OR 2005
L10 (      6815)SEA SSS FUL L8 NOT L9
L11 (      1507)SEA ABB=ON   PLU=ON  L7/P
L12 (     31232)SEA ABB=ON   PLU=ON  L10/RACT
L13 (       266)SEA ABB=ON   PLU=ON  L11 AND L12
L14            QUE ABB=ON    PLU=ON  "ASYMMETRIC SYNTHESIS AND INDUCTION
               "+PFT,OLD,NT/CT
L15            QUE ABB=ON    PLU=ON  "MICHAEL REACTION"+PFT,OLD,NT/CT
L16            QUE ABB=ON    PLU=ON  "MICHAEL REACTION CATALYSTS"+PFT,OL
               D,NT/CT
L17 (        30)SEA ABB=ON   PLU=ON  L14 AND L13
L18 (        21)SEA ABB=ON   PLU=ON  L17 AND (L15 OR L16)
L19 (     31232)SEA ABB=ON   PLU=ON  L10/RACT
L20 (      1337)SEA ABB=ON   PLU=ON  L19 AND L14
L21 (       176)SEA ABB=ON   PLU=ON  L20 AND (L15 OR L16)
L22 (        92)SEA ABB=ON   PLU=ON  L21 AND L16
L23 (    744935)SEA ABB=ON   PLU=ON  ((FE OR CO OR NI OR RU OR RH OR PD
               OR OS OR IR OR PT)(L)N)/ELS
L24 (    316118)SEA ABB=ON   PLU=ON  L23 AND 1-2/N
L25 (    262888)SEA ABB=ON   PLU=ON  L24 AND 1/M
L26 (     22790)SEA ABB=ON   PLU=ON  L25 AND 1/RU
L27 (     80253)SEA ABB=ON   PLU=ON  L25 AND (1/OS OR 1/IR OR 1/PT OR
               1/PD)
L28 (    159878)SEA ABB=ON   PLU=ON  L25 NOT (L26 OR L27)
L29 (     76518)SEA ABB=ON   PLU=ON  L28 AND 1/FE
L30 (     83360)SEA ABB=ON   PLU=ON  L25 NOT (L26 OR L27 OR L29)
L31            QUE ABB=ON    PLU=ON  L26
L32            QUE ABB=ON    PLU=ON  L27
L33            QUE ABB=ON    PLU=ON  L29
L34            QUE ABB=ON    PLU=ON  L30
L35            QUE ABB=ON    PLU=ON  L31 OR L32 OR L33 OR L34
L36 (        10)SEA ABB=ON   PLU=ON  L22 AND L35
L37 (      9613)SEA ABB=ON   PLU=ON  L5
L38 (     50879)SEA ABB=ON   PLU=ON  L10
L39 (        31)SEA ABB=ON   PLU=ON  L37 AND L38 AND L35
L40 (         7)SEA ABB=ON   PLU=ON  L39 AND L14
L41 (      1971)SEA ABB=ON   PLU=ON  L7
L42 (       315)SEA ABB=ON   PLU=ON  L41 AND L10
L43 (        14)SEA ABB=ON   PLU=ON  L42 AND L35
L44 (        39)SEA ABB=ON   PLU=ON  L18 OR L36 OR L40 OR L43
L45 (        62)SEA ABB=ON   PLU=ON  L44 OR L17 OR L39
L46 (        48)SEA ABB=ON   PLU=ON  L45 AND (L14 OR L15 OR L16)
L47            QUE ABB=ON    PLU=ON  PY<2005 OR PRY<2005 OR AY<2005 OR
               MY<2005 OR REVIEW/DT
L48 (        34)SEA ABB=ON   PLU=ON  L46 AND L47
L49 (        15)SEA ABB=ON   PLU=ON  L48 AND L14 AND L15 AND L16
L50         34 SEA ABB=ON    PLU=ON  L48 OR L49
               ---------
L51          3 SEA ABB=ON    PLU=ON  L2 AND L50
               D SCAN
               D 1-3 IBIB
L52          6 SEA ABB=ON    PLU=ON  L2 NOT L51
               D SCAN
               D COST
               D L52 1-6 IBIB ABS HITSTR HITIND
               D QUE STAT L10
               D QUE L52


    FILE 'REGISTRY' ENTERED AT 09:01:15 ON 22 NOV 2006
               D SAV
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          ACT SHI806REGB/A
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L53          STR
L54          SCR 1918 OR 2043 OR 1839 OR 1944 OR 2005
L55     6815 SEA SSS FUL L53 NOT L54
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          D QUE STAT


   FILE 'HCAPLUS' ENTERED AT 09:01:58 ON 22 NOV 2006
L56    50897 SEA ABB=ON   PLU=ON   L55
L57        6 SEA ABB=ON   PLU=ON   L52 AND L56
          D QUE L35
          D SCAN
          D QUE L35
L58        6 SEA ABB=ON   PLU=ON   L57 AND L47
          D SCAN
          D QUE STAT L58
          D L58 1-6 IBIB ABS HITSTR HITIND




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